MINUTES

OF

THE UTAH RADIATION CONTROL BOARD

December 7, 2007

Department of Environmental Quality, DEQ Building #2

Conference Room 101

168 N 1950 W

Salt Lake City, Utah 84114-4850

BOARD MEMBERS PRESENT
Kent J. Bradford, P.G., Chair
Stephen T. Nelson, Ph.D., Vice Chair
Richard W. Sprott, DEQ Executive Director
Dane L. Finerfrock, Executive Secretary
Scott Bird
Patrick D. Cone
Frank D. DeRosso, MSPH, C.I.H.
Elizabeth Goryunova, M.S.
Peter A. Jenkins, M.S., CHP
Joette E. Langianese, Commissioner
Joseph K. Miner, M.D., MSPH
Gregory G. Oman, D.D.S., B.S
John W. Thomson, M.D.

BOARD MEMBERS ABSENT/EXCUSED
Christian K. Gardner

DRC STAFF/OTHER DEQ MEMBERS PRESENT
Philip Goble, DRC Staff
Dean Henderson, DRC Staff
John Hultquist, Section Manager
Craig Jones, Section Manager
Laura Lockhart, Attorney General's Office
Loren Morton, Section Manager
Yoli Necochea, DRC Staff
Raymond Nelson, DRC Staff
Donna Spangler, DEQ Policy and Planning

PUBLIC
Grant Bird, U of U
Robert Baird, URS
Steve Erickson, Citizens Education Project
Daniel W. Erskino, INTERA, Inc.
David C. Frydenlund, Denison Mines (USA), Corp.
Judy Fahys, Salt Lake Tribune
Brian Harper, URS
Grant Hurst, U of U
Greg Hopkins, URS
Charles Judd, Cedar Mountain Env.
Mark LeDoux, *EnergySolutions*
James O'Neal
Teresa Parker, *EnergySolutions*
Tye Rogers, *EnergySolutions*
Dan Shrum, *EnergySolutions*
Dr. Kip Solomon, U of U
Robert Sobocinski, URS
Christopher Thomas, HEAL – Utah

GREETINGS/MEETING CALLED TO ORDER

The Utah Radiation Control Board convened in the Department of Environmental Quality (DEQ) Conference Room 101; 168 North 1950 West; DEQ Building 2; Salt Lake City, Utah. Kent Bradford, Chair, called the meeting to order at 2:04 p.m. Chairman Bradford welcomed the Board Members and the public. He indicated that if the public wished to address any items on the agenda, they should sign the public sign-in sheet. Those desiring to comment would be given an opportunity to address their concerns during the public comment period.

I. APPROVAL OF MINUTES (Board Action Item)

a. Approval of the November 2, 2007 Board Minutes

Kent Bradford, Chair, asked the Board for corrections to the minutes from November 2, 2007.

MOTION MADE BY ELIZABETH GORYUNOVA TO APPROVE THE MINUTES OF NOVEMBER 2, 2007.

MOTION WAS SECONDED BY SCOTT BIRD.

MOTION CARRIED AND PASSED UNANIMOUSLY

II. RULES (Board action items)

a. Five-Year Notice of Review and Substantive Changes to R313-15, "Standards for Protection Against Radiation"

Craig Jones, Manager, explained to the Board that this action item had two parts. He said the first part involved a five-year review of R313-15, "Standards for Protection Against Radiation", and the second part involved a substantive change to R313-15.

Mr. Jones said that a five-year review is essentially an opportunity for the Board to justify the continuation of a rule. A justification is made when the Executive Secretary files a Notice of Review and Statement of Continuation before January 14, 2008. Mr. Jones informed the Board that this information was included in tab 2 of the Board packet. There were no questions by any of the Board Members.

RECOMMENDATION:

The Executive Secretary recommended that the Board approve the continuation of R313-15 by directing staff to file the Notice with the Division of Administrative Rules.

MOTION MADE BY ELIZABETH GORYUNOVA TO APPROVE THE CONTINUATION OF R313-15 AND TO DIRECT STAFF TO FILETHE NOTICE WITH THE DIVISION OF ADMINISTRATIVE RULES.

MOTION WAS SECONDED BY SCOTT BIRD.

MOTION CARRIED AND PASSED UNANIMOUSLY

Craig Jones, Manager, explained that during the review of R313-15, it was noticed that some substantive-changes were needed. The changes involved revising the edition-year of the Code of Federal Regulations, which was incorporated by reference into this rule; fixing an incorrect citation of some definitions of the U.S. Department of Transportation; and fixing two incorrect citations to Rule R313-32, "Medical Use of Radioactive Material." Mr. Jones said that by changing the year of the Code of Federal Regulations, it will allow the agency to complete a rulemaking that is required by the U.S. Nuclear Regulatory Commission.

Mr. Jones explained that a copy of the proposed substantive changes was included in tab 2 of the Board packet and he told the Board Members there was a "supplemental sheet of changes" that was not previously included in the Board packet. There were no questions about this rule by the Board Members.

RECOMMENDATION:
The Executive Secretary recommended that the Board approve the changes indicated in the Board packet and in the "supplemental sheet of changes." He said this process will include giving a notice to the public of a 30-day comment period.

MOTION MADE BY STEPHEN T. NELSON TO ADOPT THE RULE CHANGES AND TO SEND THE RULES OUT FOR A 30-DAY PUBLIC COMMENT PERIOD.

MOTION WAS SECONDED BY PETER A. JENKINS.

MOTION CARRIED AND PASSED UNANIMOUSLY

b. Reconsideration of R305-3, "Emergency Meetings"

Laura Lockhart, Attorney General's Office, said that at the September 2007 Board Meeting, she asked the Board to reauthorize the "Emergency Meeting Rule." However, as a result of some questions from Richard Sprott, DEQ Executive Director, the Attorney General's Office reviewed the "Emergency Meeting Rule." The Attorney General's Office determined R305-3, Emergency Meetings," imposed additional procedures beyond those required by statute. Ms. Lockhart said that when experiencing a genuine emergency, we do not want to be tied-down to additional procedure requirements.
The statute requires, for example, that the Division provide the best notice practicable. It is our hope that in an emergency, if the Division has a web site, the notice could be on the web site. If the Division had access to a

building, the notice could be in the building. She said that DEQ should only be tied to notification-requirements required by the legislature in a genuine emergency. She added that the Department of Environmental Quality had never had an emergency meeting. She said she was looking for a motion to repeal the "Emergency Meeting Rule."

MOTION MADE BY JOSEPH K. MINER TO REPEAL R305-3, AND THEN TO HAVE A DISCUSSION ON THE MOTION

MOTION SECONDED BY RICHARD W. SPROTT

Discussion To the Motion Followed by the Board:
Joseph K. Miner asked, if the "repeal of the rule" would be discussed at a public hearing and also go out for a public comment.

Laura Lockhart, Esq., said that repealing R305-3 would be treated the same as any other rule change, and that the Board and Division would soon find out how the public felt about it. She said that she would return in a month or two.

MOTION MADE BY JOSEPH K. MINER TO REPEAL R305-3, AND SEND IT OUT FOR PUBLIC COMMENT

MOTION WAS SECONDED BY RICHARD W. SPROTT.

MOTION CARRIED AND PASSED UNANIMOUSLY

III. RADIOACTIVE MATERIALS LICENSING/INSPECTION (Board action item)

a. Agency Action: "Notification to Impound Radioactive Material" was Issued to Certified Testing and Inspection, License No. UT0600329

Craig Jones, Manager, reported to the Board on this item. Mr. Jones explained that this item had been listed as an action item, but because of changed circumstances, it was now an information item.

On November 1, 2007, the Executive Secretary took a significant enforcement action involving a company known as Certified Testing and Inspection. The Executive Secretary issued a Notification of Agency Action to impound radioactive material, specifically four moisture density gauges. Each gauge contains a sealed source of cesium-137 and americium-241. This enforcement action was necessary because the company had stopped participating in the regulatory process. The radioactive material license expired on October 31, 2006, and the company submitted a renewal license on October 12, 2006. The renewal application was not filed in a timely manner, and it was deficient.

Multiple requests from the Division for information were sent to the company. These requests were not responded to and certified mailings with a "Return Receipt Requested" went unclaimed.

Mr. Jones explained that on September 12, 2007, an inspector for the Division contacted a representative of the company by telephone and arranged for a radiation safety inspection. The inspector reminded the company's representative of the appointment by voice mail on the evening of September 26, 2007; however, the inspector arrived the next day at the appointed time, but the Certified Testing and Inspection representative was not there, and no one else was at the company's office. The Division sent a letter on September 27, 2007, notifying the representative he had missed the scheduled inspection. The letter also set a date for another inspection. Again, the Division inspector arrived at the appointed time, but there was nobody in the office.

The combination of these events led the Executive Secretary to conclude that a significant enforcement action was necessary. After receipt of the "Notice of Agency Action to Impound Radioactive Material," the company contacted the Executive Secretary and requested an opportunity to resolve the matter without a formal hearing before the Radiation Control Board. Representatives of the Division and the Attorney General's Office met with company representatives and agreed to the following:

(1) The company would transfer all of the moisture density gauges in their possession to another licensee.

At the time of the meeting, the Division representatives learned that Certified Testing and Inspection had six devices instead of four, but the company agreed to transfer all of the gauges.

(2) The company would apply for a new radioactive materials license.

By December 3, 2007, all gauges had been transferred to an authorized recipient, and on December 6, 2007, the Division learned that the applicant would submit a new license application for use of radioactive materials. The application was to arrive Monday or Tuesday (December 10 or 11, 2007).

Because of the actions taken by the company, the Executive Secretary sent a letter dated December 6, 2007, informing Certified Testing and Inspection that the Notice of Agency Action would be held in abeyance until further notice.

Questions by the Board:

Peter A. Jenkins, Board Member, asked if the gauges that were now under the control of another license could be used by the same company, and, if so, are other controls in place to ensure they are used properly?"

Craig Jones, Manager, answered that any use of the gauges by Certified Testing and Inspection would have to be done under a different radioactive materials license, as Certified Testing and Inspection no longer had a radioactive materials license. Any future use of the gauges could be done, once the company attains a new radioactive materials license.

Peter A. Jenkins asked if there were any concession or agreement for Certified Testing and Inspection to use the gauges, under the other company's license?

Craig Jones answered that there was a desire on the part of the company to continue to make use of their gauges, but as far as the Division knows, final resolutions with another licensed entity have not been reached.

Elizabeth Goryunova, Board Member, asked for the name of the other company that was holding the gauges?

Craig Jones responded that the gauges were transferred to two other companies. One is located in the State of Idaho, and the company name is Qal-Tek. The second company is in Utah and goes by the acronym of AGEC which is Applied Geotechnical and Engineering Consultants.

Frank D. DeRosso, Board Member, asked what the company offered as an excuse for non-compliance.

Craig Jones responded that the radiation safety officer, who also happened to be the company president, fell gravely ill. Essentially, he said, there was a break-down in management control, and other individuals in the company did not step-in and fulfill our regulatory requirements.

Stephen T. Nelson, Vice Chair, asked if the incident would affect the way in which the new license application was considered and reviewed. In other words, he said, will their past behavior affect their new license?

Craig Jones responded that it would. He said the Division has instructed the applicant that if they were to name the individual who has served as radiation safety officer as the radiation safety officer for the new license, the license application would not be accepted by the Executive Secretary.

IV. X-RAY REGISTRATION/INSPECTION

No Items

V. RADIOACTIVE WASTE DISPOSAL (Board information item)

a. Briefing: Disposal of Low-Level Radioactive Waste Generated Outside the U.S. at *EnergySolutions*

Tye Rogers, Energy*Solutions*, updated the Board on this item. Mr. Rogers said that he contacted Dane Finerfrock, and asked him if he could go through the U.S. Nuclear Regulatory Commission's (NRC) process for the importation and exportation of radioactive material into the U.S. Mr. Rogers said he would give the Board an overview of the application recently filed by Energy*Solutions* with the NRC to import some radioactive materials into Utah from Italy.

This is a summary of the information Mr. Rogers presented to the Board:

- NRC Import/Export Licensing Process
  - 10 CFR 110 – Export and Import of Nuclear Equipment and Material
  - NRC Form -7: Application for NRC Export/Import License—Amendment or Renewal
  - NRC Criteria for Approval /Denial (10 CFR 110.45 – Issuance of Denial of Licenses)
  - Public participation process (10 CFR 110 Subpart H – Public Participation Procedures Concerning License Application)
- EnergySolutions Import License Application
  - Request to Import 20, 000 tons (1 M cubic feet) of radioactive materials from Italy
  - Material is from Italy Nuclear Power Industry
  - All material will be imported to Bear Creek Facility (Oakridge, TN)
  - Remaining waste to be disposed at the Clive Facility
  - The material will be extensively characterized in Italy, prior to import to ensure that it meets U.S. license requirements. Waste will be transported in accordance with DOT regulatory requirements.

Questions by the Board:

The following questions were asked by the Board Members. Tye Rogers responded to the Board's questions:

Question: Will the license from the NRC strictly be an import license? Once the waste is in this country, then EnergySolutions can process it, and can ship the residues to the Clive facility. Is it necessary to amend your Utah license to accept foreign waste?

Response: The NRC has the authority for the importation of

waste. The NRC does not want waste imported into the U.S. that does not have a deposition-path. They will verify that the waste has a deposition-path. They will also verify that the licensee has a license to receive the waste. For Bear Creek, EnergySolutions had to provide the Tennessee licenses that were issued. The NRC will make certain that the waste can be received in Utah.

Question: Is there not a facility in Italy that is licensed to receive their waste material?

Response: No. They have actually been storing this waste in Italy for some time, and they have not taken care of it, because there are not any facilities to do so.

Question: How many of these licenses for waste importation for this kind of disposal has the NRC granted?

Response: A handful is what I saw.

Question: In the terms of property and interstate transport and in the context of goods that might move from one part of the country to another (commercial goods or property).

Response: Yes.

Question: At what point does Energy*Solutions* become the owner of the material? Is it an interstate-commerce, problem material?

Response: For radioactive material, the generators always "own" the waste. Even though the waste is in the United States, if there are problems with the waste, Italy is the "owner" of the waste; consequently, the waste would be shipped back to Italy. There is not a transfer of ownership.

Question: Richard W. Sprott said interstate commerce regulations may preclude certain jurisdiction by states or by others from barring movement of waste in interstate commerce. Does that have any relevance in these activities, as far as you know?

Response: Tye Rogers said not as far as he was aware.

Question: All the material received by EnergySolutions will be compliant with its current Utah license and permits?

Response: Yes. Everything going to Tennessee will be in compliance with the Tennessee license, and everything going to

Utah will meet the Utah license.

Question: Does EnergySolutions have a cap on the ultimate capacity of its facility?

Response: Yes. EnergySolutions has an agreement with the Governor not to exceed the capacity of the current license. EnergySolutions will not go beyond that.

Question: Will this material cause EnergySolutions to exceed that quantity?

Response: No. The capacity is roughly 150 million cubic feet.

Question: Over what period of time will EnergySolutions receive the waste?

Response: It will be over a five year time period.

Question: How much of EnergySolutions' remaining waste capacity will be used, and what is the total volume of waste that will be received?

Response: Very little. Mr. Roger's estimated it would be much less than one percent (1%) of the total amount that Clive receives on an annual basis.

Question: What type of disposal does Bear Creek have? What type of material can Bear Creek's disposal site handle?

Response: Bear Creek is a processing facility not a disposal facility. A large portion of the waste will be melted-down and recycled, and a large portion will be incinerated.

Question: Does the Waste Compact Agreement consider waste from outside the U.S.?

Response: That is a good question. To our knowledge (and from the legislation for the Compact) the Compact does not prohibit the importation of waste from outside of the U.S.

Final Discussion and Conclusion:

The Board continued with numerous questions on imported waste from Italy. The following concerns were discussed:

Richard W. Sprott said that Utah's citizens have been pretty clear

that they do not want Utah to be the dumping ground for radioactive waste.

Stephen T. Nelson said the Board had authority by statute to express its view. He said, at a minimum, he would like the Board to make a position statement. He said there was not a particular value to the United States or to the State of Utah to accept waste from foreign countries. He said accepting foreign waste would discourage foreign countries from finding solutions to their own waste problems.

Richard W. Sprott said the press mischaracterized the Governor's statement to be welcoming foreign waste into Utah. The Governor actually stated that he wants the waste to adhere to the rules of this Board. As far as we know, the waste does adhere to the rules.

Peter A. Jenkins stated there were plenty of business opportunities for radioactive waste disposal without going outside of the United States. He said he would support any action to prohibit the acceptance of foreign waste within the State of Utah.

The Board Members agreed to write a position statement.

Kent J Bradford said the Board did have authority to direct the DRC staff to develop rules restricting the acceptance of foreign waste.

Stephen T. Nelson said a rule would be stronger than a position statement.

Richard W. Sprott said there may be interstate commerce prohibitions against a state Board's authority. He advised that the Board instruct the Division to have the Attorney General's Office look into the authority of interstate commerce.

Kent J. Bradford asked Laura Lockhart, Attorney General's Office, to investigate the authority of the Board for this issue and report back to Board.

PUBLIC COMMENTS:

Kent J. Bradford, Chair, invited the members of the public that had concerns on this item to speak.

First Speaker:

Christopher Thomas, HEAL Utah, thanked the Board for the level of

discussion they had on this topic. He said that HEAL Utah had been contacted by many of their members about this issue. He said there were important policy considerations raised by Dr. Nelson, the Vice Chair, and by Mr. Jenkins. He said making rules and issuing a position statement was important. He said there would be political implications for Utah, if Utah became a waste repository for the world.

He asked at what point does the interest of this expanding, growing, global, nuclear-waste company outgrow the interest of its own country. This issue needs to be considered and resolved by the United States. In the interim, the Board could send a letter to Utah's congressional delegation in Washington. Mr. Thomas said there have been three members of Congress, from Tennessee, Texas and Kentucky that have raised specific concerns on this issue at the federal level. He said Utah's congressional delegation has been silent. If the Utah Radiation Control Board is not able to make policy decisions regarding foreign waste, in the interim the Board could try to elevate it to an arena that can address this issue. He thanked the Board for the attention they were giving this issue.

Second Speaker:

James O'Neal said that he was on a Board similar to the Radiation Control Board in Oak Ridge, Tennessee. He said Oak Ridge is accepting radioactive pollution from Y-12 and from World War II. He said the waste is mixed waste: it is barrels, and barrels, and barrels--it is thousands, and thousands, and thousands of pounds of mixed-waste. They do not check the waste; consequently, there are thousands of barrels of mixed-waste at Oak Ridge, and they do not know what is in them. They cannot check them. He said he is a private citizen and no one paid him to come to the Board meeting. He said he is living on his retirement, and it costs him money to travel to this meeting to address the Board for three minutes. He said the people of Utah do not want this. Those of you that have some guts need to say: "No, the people of Utah do not want it." He said he is from Provo, and he is not a left-wing radical. He said he is in Curtis Randel's District, and the people in his area do not want Utah to accept foreign waste.

Third Speaker:

Charles Judd, Cedar Mountain Environmental, said he had several concerns with the idea of importing foreign waste. First of all, EnergySolutions has told the public that they will not take foreign waste (in 2005). Mr. Judd referred the Board to an article from the newspaper. He quoted: "Company officials have said Envirocare (EnergySolutions) has not taken foreign contracts, and according to Finerfrock, the company told the State, it won't take foreign waste." Consequently, it is now a concern that EnergySolutions has said they will not take B and C waste, and a concern that EnergySolutions has said, they will not expand. What

will EnergySolutions do?

EnergySolutions has said they will not take foreign waste, and today, for the first time, EnergySolutions informs us, they are taking foreign waste. This is a concern, because the waste that is brought into Utah is supposed to be identified. Waste shipments have records that include the state of origin, and the waste's original location is reported to the State. These records are a public record. Mr. Judd said he has reviewed the waste shipments for the last six months. He said waste processing facilities identify specifically the state of origin. On the copy of the waste manifest Mr. Judd provided the Board, one cubic foot of waste is identified as coming from eight different states. This is an example of how close the origin of the waste is verified. Mr. Judd said that he did not find any foreign waste identified. He said the foreign waste was not identified, but he believes EnergySolutions has already received some foreign waste. He said he would like to know, if EnergySolutions has been taking foreign waste, and what has changed their mind about taking foreign waste.

Mr. Judd said that several months ago, he asked about the remaining disposal capacity in the 11.e.2 cell. He said the site is licensed for 70 million cubic feet, and that is all. He said at least six million needs to be saved for the site's clean-up. This leaves 64 million cubic feet licensed for disposal. If you look at EnergySolutions' SCC filing, they have suggested to their investors that they currently have agreements with 82 nuclear reactors in the United States. The average reactor, such as Connecticut Yankee and Main Yankee, has two million cubic feet each. One site had 3.6 million cubic feet, and the other had about 1.6 million cubic feet. If EnergySolutions has 82 similar sites under contract, where is 160 million cubic feet going to be disposed? Before EnergySolutions makes agreements to bring waste from nuclear reactors all over the country, we need to decide how much space there is available. If EnergySolutions does have 82 agreements with 82 different nuclear reactors, this Board ought to look at these agreements very closely. Mr. Judd said he would give the Board copies of his information.

Mr. Judd said he had discussed his concerns with the NRC, and the NRC has said they will listen to the State. Mr. Judd said he believed the State had a lot of say about what the NRC will do with this. If many, various sources in Utah have informed you that they do not want radioactive waste and foreign waste, he believed the NRC would listen to the Board.

VI. URANIUM MILL LICENSING AND INSPECTION (information item)

a. Briefing: Preliminary Results of Groundwater Isotopic Study and Age Dating of Compliance Monitoring Wells at Denison (USA) Mines, Inc. Uranium Mill

Loren Morton introduced Dr. Kip Solomon from the University of Utah. Loren explained that Dr. Solomon would present his work and that of his graduate student, Grant Hurst. Loren informed the Board that Dr. Kip Solomon's work from the University of Utah was entirely funded by the Division of Radiation Control.

Dr. Kip Solomon, University of Utah, said he appreciated the opportunity to speak. He acknowledged the efforts of Grant Hurst and some of the other students from his lab, and the very long hours they spent completing the study. He said the Department of Environmental Quality was very helpful, and Denison Mines (USA) Inc. was very cooperative. He said they worked some very long hours, weekends, and holidays. Everyone came together to do this in a very rapid manner.

Dr. Kip Solomon presented his outline by slide show, and he went over the study he completed on the groundwater wells at Denison (USA) Mines, Inc. In summary, this is what he said:

(1) Vertical variations in ground-water, travel times were studied to try to understand whether or not there was the potential for some stratification in the aquifer, and to get an indication of the potential for contaminant sources at the surface.

(2) Low-flow sampling technology: sampling near the top of well screens, where water could potentially be younger as opposed to conventional sampling technology.

(3) We wanted to try to correlate some contaminant concentrations with groundwater ages to better understand some temporal trends that had been observed.

(4) We wanted to evaluate the use of some stable isotopes as finger-printing technique for tailings derived from water and solutes.

(5) The most important measurement that we have made is a measurement of the tritium.

    a. Tritium is just radioactive water. It is part of the water molecule, and it serves as one of the best hydrologic tracers, because in Utah we are painfully aware that in the mid 50's and 60's above-ground, weapons testing injected a large amounts of tritium and many other things into the atmosphere as shown by this graph.

    b. Although the concentrations have dropped off substantially,

we can still see that there are measurable quantities of tritium that exist in natural precipitation.

(6) I do want to point out that even the very highest concentrations are still quite minor, from a health point of view. Even the peak concentrations are below the current, drinking-water standard for tritium.

a. What is significant for our purposes is that water that fell as precipitation before the 1950's, because of the half-life of tritium (which is about 12 or so years), today, those waters would have less than one tritium unit or "TU," of tritium in them. This is a very good way to distinguish waters that fell in the past; versus, the waters that have fallen during the nuclear era in Utah.

b. There are a couple of wildlife ponds on site, and these have tritium concentrations, as we would expect for surface water facilities that are receiving modern participation. These are values that we would expect.

c. There are a few wells in the surface that also have some modern tritium in them

d. I think the biggest revelation is that there are a very large number of wells that have tritium at levels that are below our detection limit, and we have one of the lowest detection limits in my lab. A few of the wells have little hints of tritium, but almost all of the wells are almost below this one "TU." Consequently, we are looking at waters that were recharged prior to 1950, with some important exceptions.

(7) Samples from the subsurface that have tritium in them are associated with a developing mound in the water table. It is the result of the water recharging in the subsurface of the wildlife ponds.

a. The construction of the wildlife ponds has resulted in an injection of water that is affecting the water flow-system. The higher levels of tritium are in the wells that are showing a response to the changing flow-system.

(8) We measured the concentration of chlorofluorocarbons (CFCs). These are synthetic compounds that did not exist. We, as a nation, synthesized them in the early 1900s, and then they were used as

refrigerants and as foaming agents. As many of us know, the concentrations in the atmosphere started increasing. Water that recharged in 1980 would have been in contact with this water. Thus, it becomes a way to date the ground water.

In conclusion: The surface water-sites and the wells that have tritium, also have CFC concentrations. We do not have the measurements, because of some technical problems. They all have CFCs associated with them.

Many of the wells that did not have tritium do not have CFCs--this seems consistent. But, it is interesting that there are a number of the wells that did not have any tritium, but they have small amounts of CFCs.

There is tritium coming in, but by the time it actually makes it to the water table more than 50 years has elapsed; consequently, he tritium content of water in these monitoring wells is low. This is tritium that was here, prior to the bomb era.

CFCs are different than tritium. They can be transported through the unsaturated zones as a gas. The soil atmosphere can breathe, and there can be barometric pumping. What it means is that the CFC clock starts at the water table; whereas, the tritium clock starts at the ground's surface. There is the existence of small amounts of CFCs in some of the wells. This tells us that natural recharge is occurring. If there were absolutely no water moving down to the water table, we would not have any CFCs at all. Consequently, we think the shallow aquifer is old water, but there is some recharge from the surface occurring.

Our low-flow sampling did not reveal any significant information compared to the conventional sampling. There are some exceptions with two wells. Two wells have deviated from 2002 quite a bit. They have deviated in previously in 2003 and 2004 samplings, as well. This simply indicates that concentrations in these wells have actually changed since 2002. For the most part the low-flow sampling yielded the same results as the conventional sampling, and that is our point.

The final thing, I want to show you is the isotopic finger-printing. To put this in another way, a sulfur isotope turns out to be a very, sensitive tracer to very small amount of solutes from the tailings cells. A drop of it is put into a big bucket. This will be observed in the stable isotopic composition long before it is found in the absolute concentration. It is a really good finger print.

We are not quite sure why the wildlife ponds bear the signal of the tailing cells. We have some theories. It might include some transport via the

wind of very small amounts of sulfate into these wildlife ponds. We are not yet positive that we can distinguish a natural source from a tailings cell; except, we are quite sure that the wells themselves do not look anything like either of these with a few exceptions.

Preliminary conclusions: most of the monitoring wells have very low tritium, and this very strongly suggests that most of the water fell as precipitation prior to 1950. It is, generally speaking, older water. The presence of small amounts of CFCs in monitoring wells combined with the observation that the water table has been mounding, as a result of these wildlife ponds, tells us that the system is not limited by permeability. It is limited by the availability of water. There is a sluggish, flow-system, because it is dry. If you put water in the system, it will transmit the water. It will not be at the rate of a gravelly aquifer. It has a modest permeability, but is not zero permeability.

Kind of a cautious bottom line, because we are still trying to understand the data, is that the existence of old water that predates the facility combined with the lack of a surface finger-print in most of the groundwater monitoring-wells, indicates that the tailings cell-containment is functioning.

Presentation by Bob Sobocinski, URS, on Background Groundwater at the Mill Site:

Bob Sobocinscki said he worked for URS. The Project Team includes Brian Harper, Steve Snelgrove, Bob Baird and Mr. Sobocinscki. The Project Team is located here in Salt Lake City, Utah. We have been looking at the background groundwater-chemistry associated with the mill site.

We reviewed four reports, basically two original and two revised reports. The first is the background, groundwater-quality report for existing wells submitted to the Division of Radiation Control in December 2006. Then the DUSA followed with an addendum (an evaluation of available pre-operational and regional background data in April 2007). In response to completeness review of the first background groundwater quality report, Denison (USA) Mines, Inc. issued the revised background report in October 2007. In order to be consistent with the findings of the completeness review, they issued the revised addendum in November 2007.

The objective of the reports is to find background levels of constituents in groundwater at the site and then to established groundwater quality compliance limits in accordance with the facilities groundwater-discharge permit and Utah Administrative Code.

The intent was to streamline the process for demonstrating compliance and ultimately to assure that groundwater protection is achieved and maintained. The contents of the reports are from the requirements of the permit to submit a background, groundwater-quality report for existing wells The requirements of the permit is for the report to include all available groundwater-quality data for all existing wells to meet the requirements of the permit. The report should include all available groundwater quality data for all existing wells, quality assurance evaluation, and validation of existing and historic on-site groundwater-quality data. The report also will include an examination and justification of any temporal and or spatial dual groundwater-quality, concentration phenomena--and also descriptive, statistics for each well and groundwater constituently listed in the Table 2 of the groundwater permit.

A quick timeline: March 2007 the Division hired us to perform the review. We kicked it off in April 2007, and in August 2007 we submitted the completeness review for the background, groundwater-quality report and the addendum. A day later the Division issued the completeness review findings and a confirmatory action level to Denison (USA) Mines, Inc. On August 16, 2007, DUSA submitted a flow chart of the proposed data prep and statistical process for the work.

About a week later on August 21, 2007, the Division issued conditional approval of the flow chart to Denison (USA) Mines, Inc. (DUSA). Denison (USA) Mines, Inc., went ahead and revised the statistics in accordance to the flow chart and submitted the revised background report in October, 2007. Then we followed up with a revised addendum in November, 2007. In November 21, 2007, we submitted a DRAFT Completeness Review of the Revise Background Report to the Division.

Based on the information in the reviewed reports the groundwater chemistry data sets had different reporting standards that were typical of data sets acquired over an extended period of time. That extended period of time for some of the older wells is up to 20 years. What we mean by different reporting standards are things like changes in reporting limits. For some of those the reporting limits may be insensitive to state groundwater quality standards. Also, for something like uranium, they may have analyzed it radiologically as well as in mass units, and the second bullet (referring to the chart), DUSA did perform and document their QA and validation of a data sets and adequately addressed these issues in reporting standards to have a consistent data set.

The background, groundwater-chemistry is quite variable, spatially and temporally. In certain wells, the groundwater-quality standards are exceeded by background levels. Also certain constituents are present, some of them known to be in the tailings waste-water and show increasing

temporal trends.

Some of this is really a repeat of what Dr. Kip Solomon reported. On the east side we observed large changes on the groundwater elevations starting about 1994 to present. We think these are likely related to the wildlife ponds (recharge from the wildlife ponds). They may influence some of the changes observed in the groundwater chemistry in some wells. However, there are trends and changes in wells on the west side where the groundwater elevation in the record has not increased. We do not believe that all changes in time and space are related to being recharged to the wildlife ponds.

The reports are generally consistent with the preliminary findings of Dr. Kip Solomon. The statistical method that Denison (USA) Mines, Inc. used to develop the groundwater-compliance limits follow the development of the flow chart of last summer (2007). The methodology was consistent with EPA's guidance and it adequately addressed censored data sets. That's a large fraction of this really, because the data set for the site ranged from 100% non-detect to 100% detect, depending on what you're talking about (generally chemistry or trace metals). The groundwater-compliance limits listed in the revised reports were determined in accordance with the statistical methodology or the Utah Annotated Code (UAC) R-317-64, which is the fraction-approach based on the classification of water.

The background levels of some constituents in certain levels were greater than groundwater quality standards. In these instances, of course, some of the proposed groundwater-compliance limits are greater than groundwater-quality standards. I would like to emphasize that is just a function of fact that background for certain constituents is relatively elevated. This is a little bit preliminary, but what we are seeing in the groundwater chemistry data did not show any evidence of leakage from tailings site. I would like to point out that Well 22 is not one of the existing wells that is subject to the report. It does not have a lot of sampling history, and is not included in those reports. Wells and parameters with increasing temporal trends could impose a challenge for future compliance determinations.

We are reviewing the constituents that Denison (USA) Mines, Inc. has stated are statistically turning upward. What we are finding is that based on the statistics half of them are trending, and we want to separate out what sort of a statistical artifact. There may be things that are actually trending, and we will have a look and see, if there are any patterns in the occurrence of constituents.

We are in the process of completing the review of the revised "Water

Quality Report," or complete review that is due to the Division in a week, next Friday (December 14, 2007). And based on this right now, recommendations are to continue to monitor a suite of analyzes**.** We don't feel that any one constituent is an ideal indicator of contamination. It is a matter of looking at a group of constituents, perhaps trace metals that do not need to continue to be monitored.

This may be a little preliminary; however, the DUSA has proposed removing Well 26 and 32 as tailings cell, monitoring-points, because they are located in a chloroform plume-area, Well 26 is being pumped. We felt that because of their location near the tailing cells it would be better to leave those in. If there are exceedences, it would be better to examine them in light of the pumping or the remediation rather than to just pull those out.

Some exceedances of groundwater compliance limits will occur during routine monitoring. Where these are related to trends, additional understanding of the subsurface environment may be warranted--in the near term, particularly on that east side where recharge may change things over time from the ponds. Right now limited sampling analysis for constituents not typically monitored could demonstrate that leakage is not the cause of exceedances and some of these non-typical constituents are things that Dr. Solomon talked about: stable isotopes in water and particularly stable isotopes of oxygen and sulfur and sulfate, tritium, possibly CFCs. One thing that we haven't tested is uranium isotopic ratios; 234 and 238. If there is a difference between wildlife ponds and the tailing cells and the groundwater, it may be something that the system would be sensitive to, if there was any leakage.

In summary, the stable isotopes that Dr. Solomon spoke about are definitely useful indicators. On the east side that may not be the case in the future, but we feel that with what has been done, we can move forward with the approval of the background report and the compliance limits--pending our review and resolutions of findings from that review.

b. Briefing: Preliminary Findings of the Review of the Background Groundwater Quality Report for the Existing Wells at Denison (USA) Mines, Inc. Uranium Mill

Loren Morton, Section Manager, summarized both of the studies. He said there is good news and bad news. The good news is that the majority of the monitoring wells around the facility have ground water that is very old. Where there has been an increasing contaminant trend, it is not a product of tailing-cell leakage. That allows us to move forward and set the groundwater compliance limits.

Mr. Morton emphasized that the wildlife ponds leak. The ponds have changed the ground water velocity; the ground water flow directions; and the chemistry of the system. The chemistry is important, because it may be contributing to the some of the upward trends in some contaminants. It has also changed some of the stable isotopes that Dr. Solomon looked at. Today, the isotopic evidence was there to help us make our conclusions, and move forward with a variety of compliance limits for the facility. Mr. Morton said we would not have had this luxury a decade or two from now, with a continuing increase of contaminant trends. In the future, this will complicate compliance decisions.

In the future, that last bullet at the bottom (pointing to the graph), we might find that conventional, groundwater, monitoring-techniques may become impotent at this site for detecting leakage from the tailings cells. He said there are solutions, and we hope that Denison (USA) Mines, Inc. will come forward with some proposals as to how to address and resolve these concerns.

Questions by the Board:

Kent J. Bradford said if there was a small leak, it could potentially take 50 years before it hit the groundwater; consequently we would not know for about 50 years. Maybe we need some vadose zone-monitoring to detect it earlier.

Dr. Kip Solomon responded that this was a very, very good point. There is a big, lag-time.

VII. OTHER DIVISION ISSUES

No Items

VIII. PUBLIC COMMENT

Please refer to Item V. a., for comments from the public on this item.

IX. Next Scheduled Board Meeting: January 4, 2007, at DEQ Bldg 2, Conference Room 101, 168 North 1950 West, Salt Lake City, UT

THE BOARD MEETING ADJOURNED AT 4:00 P.M.